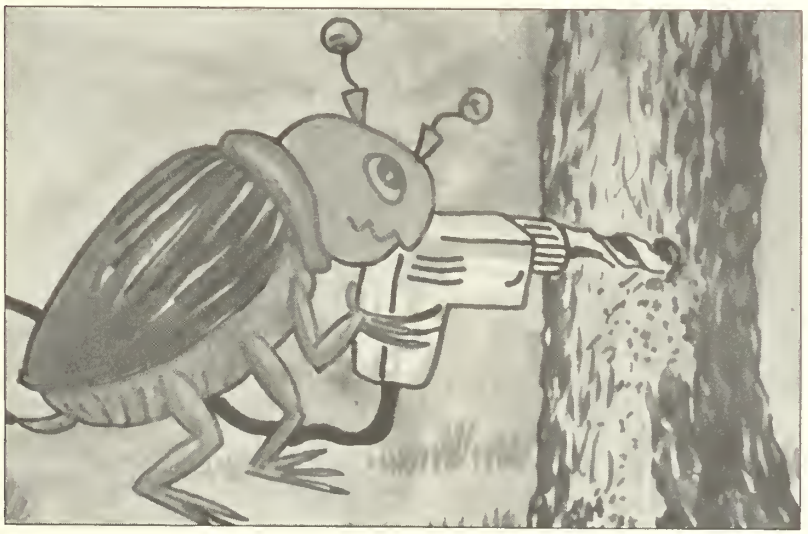
Georgia Forestry Commission

FOREST HEALTH FACT SHEET

FOREST HEALTH MONITORING
FOREST PEST MANAGEMENT
GEORGIA FORESTRY COMMISSION

SOUTHERN PINE BEETLE CONTROL TECHNIQUES

Southern pine beetle (SPB) caused timber losses can be reduced through the use of one or more recommended direct-control tactics. SPB control, to be most effective, should be a year-round activity. Major efforts should be made from late spring through fall to control actively spreading infestations. Winter and early spring treatment is also important to reduce the potential for spot growth as well as new spot development later in the spring and summer. Although infestations are concentrated in fewer trees for longer periods of time during the colder months, the spots are harder to detect from the air because of slower crown discoloration.



DEFINITIONS

The techniques used for SPB control are based on biological and cost effectiveness. Furthermore, they reflect the reality of SPB outbreaks and focus on the achievable goal of controlling spot growth. Four techniques or methods are used to control SPB spot growth. A brief definition of each follows:

1. *Cut and remove* — felling and removal of infested trees and a buffer of adjacent, uninfested, green trees. (Figure 1) This technique reduces the number of beetles available to attack new trees.
2. *Cut and leave* — felling of infested trees and a buffer of adjacent, uninfested, green, trees toward the center of the spot. This technique disrupts pheromone production and beetle attack-behavior.
3. *Cut and hand spray* — felling, limbing and bucking infested trees into manageable lengths and hand spraying with Lindane or Dursban (Chlorpynfos). This technique destroys beetle broods before and during emergence.
4. *Pile and burn* — felling, piling and burning infested trees to destroy beetle broods before they emerge.

Fig. 1. The buffer strip should be at least the width of the tallest trees in the spot, and should encompass the active head.

CUT AND REMOVE

General Forest Area

Cut and remove is the prompt removal of infested trees. Removal of infested trees and an adequate buffer strip prevents spots from spreading. The inclusion of a buffer ensures the removal of freshly-attacked pines that were overlooked or became infested after the spot was first evaluated and marked. SPB infested trees must be promptly removed to achieve maximum effectiveness: stopping additional spot spread. Because both the beetles and their associated pheromone source are removed from the site, the potential for spot spread is minimized.

Managers and owners usually prefer cut and remove over the other control options because infested trees are removed from the forest and used, giving the landowner some financial return. However, removal of individual spots is not always practical because of inaccessibility, insufficient volume, poor lumber or pulpwood markets, and environmental considerations. In addition, cut and remove often takes longer to implement than alternative tactics. Despite these limitations, cut and remove, when properly and promptly applied, remains the most practical and economical control tactic for treating most large, rapidly-growing infestations.

Near Red-Cockaded Woodpecker Colony Sites

Cut and remove can be disruptive to the red-cockaded woodpecker and should not be used during the red-cockaded woodpecker breeding season (from March 1 until the young have fledged, approximately July-August). When cut and remove is used, only infested trees should be cut; trees vacated by the SPB should remain standing. Uninfested trees within a 200-foot red-cockaded woodpecker buffer should not be cut unless absolutely necessary to prevent the SPB from infesting cavity trees.

CUT AND LEAVE

General Forest Area

Cut and leave involves felling infested trees and a buffer strip of uninfested trees so that the crowns point toward the center of the spot. This treatment disrupts spot growth and causes emerging adult beetles to disperse into the surrounding forest. It is usually recommended for spots with 100 infested trees or less.

Cut and leave is practical, relatively inexpensive, and requires a minimum of labor, equipment, and training. The procedure can be applied soon after spots are detected. Freshly-attacked trees are sometimes difficult to detect during the early stages of attack. Therefore, the major disadvantage is that a buffer strip of green, uninfested trees must be felled around each spot to assure that freshly-attacked trees are included in the treatment. In the general forest area, many landowners, are reluctant to sacrifice this buffer if the trees cannot be salvaged.

Expanding spots involving more than 100 active trees are more difficult to stop with cut and leave. Breakouts are more likely to occur for spots exceeding 100 active trees.

Nevertheless, cut and leave

remains useful mainly because of another beneficial effect —when a buffer strip is included, it usually stops the expansion of a spot. The biological rationale for spot disruption by cut and leave is based on the way individual spots expand during the summer. Continuous spot growth requires at least three factors: emerging beetles, nearby pine trees, and a source of secondary attractants. Felling the most recently attacked trees eliminates the attractant source. The felled buffer strip eliminates nearby unattacked pines, and beetles emerging from the infested trees tend to disperse in the absence of attractants.

The fate of beetles that are not killed or removed mechanically has been partially explained by SPB population dynamics research. This research has determined that long-range beetle dispersal normally occurs when temperature conditions are favorable — from November through March. Very little dispersal occurs during the warmer months because of the weakened physiological condition of the beetles — the stored fat from which the beetles draw energy for flight is lowest during this period.

Near Red-Cockaded Woodpecker Sites

Cut and leave is the preferred technique for controlling spots near red-cockaded woodpecker colony sites during the birds' breeding season. The effectiveness of this method is greatest from May to October, which generally coincides with the red-cockaded breeding season. After the breeding season and during the winter months the more effective cut-and-remove method can be used. Trees vacated by the SPB will not be cut. Uninfested trees within a 200-foot red cockaded woodpecker colony buffer zone will not be cut unless absolutely necessary to prevent the SPB from infesting cavity trees.

CUT AND HAND SPRAY

General Forest Area

Cut and hand spray is the felling, limbing and bucking of infested trees into manageable lengths and hand spraying with an insecticide. Insecticides may be used to control the SPB in individual trees or small groups of trees. Registered insecticides, Lindane and Dursban (Chlorpyrifos), are available for this purpose. Although chemical control is costly and raises some environmental concerns, it may be the best alternative in urban forests, high-value recreational areas and, to a limited degree, in commercial forests when other methods cannot be used.

Because of high costs and environmental concerns, no large-scale chemical bark beetle control projects are likely to be undertaken in the South. Nevertheless, a need remains for a fast-acting, effective tactic to reduce SPB concentrations. To date, only insecticide sprays can assure this level of protection. In commercial forests, insecticides are useful for treating small spots during the winter, spots inaccessible to heavy equipment, and or breakouts.

The use of insecticides in forests will be limited because of high costs, the need to fell and spray all surfaces of infested trees, safety precautions, and toxicity to non-target organisms.

Near Red-Cockaded Woodpecker Colony Sites

This method can be used when alternative methods are outside their effective period (cut and leave during March and April) or not feasible, or when a biological evaluation determines that foraging habitat loss due to control must be minimized. In no case will any standing trees be sprayed.

PILE AND BURN

General Forest Area

Pile and burn refers to the felling, piling, and burning of infested trees. This technique is one of the oldest SPB control methods, and also is one of the most effective when properly done. However, because of high costs and environmental constraints, the practice has been used sparingly in recent years. The bark must be completely burned to achieve control. Vacated trees need not be cut, piled, and burned. For practical reasons, both infested and vacated trees are usually piled and burned to clear the site for regeneration. Because burning can cause wildfires, this technique should be restricted to periods of low fire danger. Also, federal and state air pollution laws must be followed.

The biological rationale for pile and burn is comparable to that for

cut and remove and cut and hand spray — the beetles are destroyed if the infested bark is completely burned. This practice has been largely abandoned, however, because of the labor and logistical problems involved. In most cases, heavy equipment must be used to pile the trees. In wet areas, burning felled trees becomes extremely difficult. In dry areas, the procedure increases the chances of wildfire, and burning must be restricted to days when fire danger is low.

Near Red-Cockaded Woodpecker Colony Sites

This method will not be used in or near active red-cockaded woodpecker colonies.

BIOLOGICAL CONTROL

Several species of parasitic and predacious insects feed on southern pine beetles. Their ability to keep the southern pine beetle under control depends on many factors. The insect most famous for its ability to devour southern pine beetles is the checkered beetle. (Figure 2) Regardless of the control technique, older killed trees should be left standing where feasible to protect as many checkered beetles as possible. These older kills usually harbor numerous checkered beetles, and they also provide various woodpeckers with nesting sites.

Fig. 2. An adult checkered beetle feeding on a southern pine beetle. Checkered beetles require a longer development period than southern pine beetles and it is for this reason that older kill trees be left when feasible.